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OPERATIONAL PLAN

ZECTRAN PILOT TEST
NEZPERCE NATIONAL FOREST, IDAHO
1969

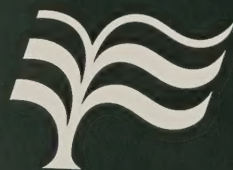
U.S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE
Division of State and Private Forestry
Northern Region

Missoula, Montana

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May 7, 1969
Date

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Division of State and Private Forestry

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Date

for NEAL M. RAHM, Regional Forester

May 12, 1969
Date

/s/ Joseph F. Pechanec
JOSEPH F. PECHANEC, Director, INT

May 23, 1969
Date

DONALD P. GRAHAM, Acting Director,
Division of Forest Pest Control, WO

Date _____

/s/ Robert D. McCulley

ROBERT D. McCULLEY, Director, PSW

May 20, 1969

Date

WILLIAM E. WATERS, Director,
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Date _____

OPERATIONAL PLAN
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INTRODUCTION

Zectran, a nonpersistent carbamate insecticide, has been tested since 1964 for control of the western budworm, Choristoneura occidentalis Freeman. Tests to date have demonstrated the insecticide to be effective and safe--no adverse effects on wildlife, and little or no reduction of insect populations, other than budworm and some associated defoliators.

Development of a new spray system to produce droplets of very small size provides a need for additional tests on insecticide application methods and techniques. More information is needed about atmospheric transport and diffusion of spray material. Refinement of methods of sampling budworm populations for suppression work, effect of insecticide on fecundity, and impact of predator and parasite populations need to be tested.

Because this additional work is needed before Zectran can be considered to be ready for operational use, a test is planned for 1969. Sufficient Zectran is available to spray approximately 16,000 acres.

The major objective of the 1969 test will be to determine effectiveness of aerial application methods and techniques of applying 0.15 pound Zectran in a carrier for suppression of budworm infestations. Two applications will be tested: one using 0.15 pound Zectran in 2 quarts of carrier; and two using 0.07 pound Zectran in 2 quarts of carrier applied approximately 4 days apart. Each application will be replicated once.

Criteria for measuring effective budworm control will be based on five separate phases: (1) approximately 80 percent larval population reduction, (2) impact against surviving budworm populations, (3) effects on budworm fecundity, (4) impact of predators and parasites, and (5) effect on associated insects.

PLANNING

A preliminary planning session was held in Ogden, Utah, to lay the groundwork for this year's test.^{1/} Subsequently, a special task force group was set up to discuss budworm sampling, insecticide spray criteria, and suppression standards.^{2/}

^{1/} Minutes of Zectran Planning Meeting held January 30 and 31, 1969, in Ogden, Utah.

^{2/} Minutes of special task force group meeting held February 18 and 19, 1969, Ogden, Utah.

Planning sessions were held during January, February, March, and April with Missoula Equipment Development Center and Division of Fire Control, Missoula, Montana, to determine needs for special equipment and aircraft for the test.

Numerous planning meetings were held on the Nezperce National Forest, Grangeville, Idaho, to discuss project layout, manpower requirements, and field facilities needed during testing period.

COOPERATION

The Northern Region will have the responsibility of directing this year's test. Fecundity studies will be carried on by Intermountain Forest and Range Experiment Station, Missoula, Montana. Southeastern Area, Atlanta, Georgia, and the Pacific Southwest Forest and Range Experiment Station, Berkeley, California, will provide assistance in rearing and analyzing parasite data. Procedures will conform with techniques developed by Dr. Carroll Williams and Pat Shea. Personnel of the Northeastern Forest and Range Experiment Station, West Haven, Connecticut, are designing the entomological sampling plan.

INFORMATION, EDUCATION, AND PUBLIC RELATIONS

The major I&E activities covering the 1969 test will be administered by Robert S. Mathison, Timber Management Staff, Nezperce National Forest. The information program will insure that key individuals and the public are informed about the project.

The fact sheet prepared during 1968 was revised to include 1968 test results and was distributed.

Letters outlining the test were sent to interested Federal and State Fish and Wildlife agencies, Water Pollution Control Administration, University of Idaho, and Idaho Department of Public Lands.

In April public meetings to discuss the test were held in Lewiston and Grangeville, Idaho. News releases followed these meetings.

ADMINISTRATION

Personnel from the Forest Insect and Disease Branch, Division of State and Private Forestry, Missoula, will administer the test. Headquarters and all operational phases will be at Grangeville, Idaho. Operations will begin on or about June 16. Estimated costs are shown in table 1.

An administrative assistant will be detailed from the Nezperce Forest to handle this part of the project. He will be responsible for purchasing necessary supplies and timekeeping.

Aircraft and Aircraft Facilities

Two C-47 aircraft will be used to apply the insecticide. One is the Forest Service C-47 aircraft used in the 1968 test in the Blackfoot River drainage; the other is a contract aircraft from Johnson Flying Service. One Cessna 180 will be used for smoke and temperature readings. An additional Cessna 180 or 182 will be needed for the observers during the actual spraying operations. A helicopter will be used to mark the spray boundaries. All aircraft will operate from the Grangeville airstrip.

ORGANIZATION

The appended chart shows overall project organization. Personnel will need to be detailed from Region 1; Nezperce National Forest; other Forests in Region 1; and other Regions. A brief description of duties and the period personnel will be needed are shown in table 2.

TRANSPORTATION

At least 15 vehicles will be needed for the test. Vehicles will be furnished by the Regional Motor Pool, Nezperce Forest, or rented.

Each driver will be responsible for safety and maintenance of assigned vehicle.

COMMUNICATIONS

The Nezperce Forest air net radio system will be used to provide communications between aircraft, airport, and ground personnel. The Regional air net will be used if needed.

TEST AREA

This pilot test will be conducted within areas of varying degrees of defoliation on the Nezperce National Forest near Grangeville, Idaho. Four areas will be treated, two north of the South Fork of the Clearwater River and two south of the Clearwater River south of Grangeville, Idaho (see enclosed map). Each is approximately 4,000 acres in size and are separated from each other at a distance of at least 5 air miles. The enclosed map delineates spray areas.

ENTOMOLOGICAL PHASES

The sampling plan has not been submitted, but as soon as it is received it will be an appendix to this plan. However, indications are that about 300 trees of mixed species (grand fir, Douglas-fir, true fir, and spruce) will need to be sampled in each area. Samples will be taken at top, mid-, and

bottom crown levels with extendable pole pruners. Samples will be put separately into plastic, cloth, or paper bags and held in refrigerated storage until examination by women checkers is made. An entomologist will be assigned full time to laboratory phases during the entire project. He will be responsible for larval instar determinations, larval rearings for parasites, and supervision of women checkers.

A plan will be prepared and submitted by INT on fecundity studies.

Sample Points

Sample plots will be selected from aerial photos prior to treatment. After selection, plots will be checked on the ground and marked as to their suitability for sampling.

Larval Development Samples

Larval development sampling will be started sufficiently early to determine rate of development for timing of spray application. An indefinite but sufficient number of sample branches will be collected at each point to assure sufficient larvae (at least 100 larvae per collection) to determine the population development rate. Initially, collections will be made every other day, but will be on a daily basis as larvae reach late instars. Larval head capsules will be measured with a microscope in the laboratory. Spraying will begin when 50 percent of the larvae are in the fifth instar.

CHECK TREES

Check trees of mixed species will be used to determine impact of spray drift on budworm populations and differences in parasite populations from sprayed trees. These check trees will be selected from scattered locations near the main spray areas. They will be sampled the same as treatment trees. Drop cloths will be used to check larval kill or drop from insecticide influence. Approximately 30 trees will be used for each spray area--120 check trees.

TREATMENT SPECIFICATIONS

Two plots will be sprayed with 0.15 pound of Zectran in Dowanol at the rate of one-half gallon per acre. The other two will be sprayed as follows: Each will receive one application of 0.07 pound Zectran in one-half gallon of Dowanol per acre. Approximately 4 days later each plot will receive this same application again. This will result in each plot having received approximately 0.15 pound in 1 gallon Dowanol per acre. These treatment specifications will give at least three different dosage variables: (1) 0.15 in one-half gallon per acre, (2) 0.07 in one-half gallon per acre, and (3) 0.15 in 1 gallon per acre.

METEOROLOGICAL READINGS OR RECORDINGS

George Downing, entomologist, Southeastern Area, will be detailed to the project to serve as a consultant to the project director and undertake monitoring and recording of atmospheric conditions. The use of very fine spray droplets for aerial spraying requires that they be applied under the most optimum conditions. Temperature data, obtained under different meteorological conditions over each spray area, will be used to determine if inversion or lapse conditions prevail and their relative magnitude. Observations of smoke released over the spray areas will indicate wind direction at different levels, and identify air movement that may influence dispersion of spray particles. These data will provide essential information needed for spray timing and duration of each day's work. Smoke may also be used to direct spray pilots over areas where spray runs are difficult to describe or accurately place on a map.

Downing will also provide technical assistance in plotting spray runs and supervising aerial observers. A permanent record will be made about where spray releases were made. This will provide a basis for determining where misses in coverage may have occurred and may be related back to results obtained on the ground.

FLIGHT PATTERN AND SPRAY AIRCRAFT

The flight patterns for particular drainages will be determined by project director, spray strategist, and air operations officer several days in advance of spraying.

One fixed-wing, single engine aircraft equipped with a smoke generator to monitor inversion layers will be used extensively during June in simulating spray runs with smoke.

SAFETY

All Forest Service Employees

The safety program is the direct responsibility of the project supervisor. Instructions outlined in the Forest Service Health and Safety Code Guide will be enforced. However, all supervisors will point out specific hazards and see that each employee follows safe working procedures. Each employee is responsible for:

1. Developing safe working habits and attitudes.
2. Assisting fellow employees in maintaining safe habits.
3. Checking vehicles each day to insure safe mechanical condition.
4. Prompt reporting and documenting of all accidents to his immediate supervisor.

5. No smoking in insecticide loading and aircraft refueling areas.

6. A doctor familiar with cholinesterase inhibition will be on immediate call in case of accidental insecticide exposure.

Aircraft

Safety regulations developed for use of Forest Service aircraft will be followed.

As an added safety measure, pilots will be required to wear respirators capable of filtering out any toxic fumes during actual spraying.

Emergency Jettison of Insecticide

In case of emergency jettison of insecticide load, the project director will immediately notify the State Fish and Game Department.

Loading Insecticide

Once Zectran concentrate has been mixed with the carrier, it can be handled with about the same degree of safety as DDT sprays. Because of its low hazard from dermal exposure it can be handled with a far greater degree of safety than many of the organic phosphates and other agricultural chemicals. However, loaders are commonly exposed to far greater quantities of any insecticide than they realize.

Zectran presents a low degree of hazard from eye and skin contact, but a moderate to high degree of hazard from ingestion. Because of its toxicity by ingestion, care will be exercised to avoid breathing spray mists of Zectran formulations. Everyone handling either the concentrate or dilute material will:

1. Be required to wear rubber gloves and clothing that will protect the body from accidental spillage.
2. Persons coming in direct contact with insecticide will wash with soap and water as soon as possible.
3. No person will eat or smoke while handling insecticide.
4. Wear respirator to filter out any toxic fumes.

Only authorized personnel will carry out the loading operation. Care will be taken in removing the filler hose nozzle from spray tanks to prevent spillage of chemical on aircraft and ground.

Table 1.--Estimated cost, 1969 spruce budworm Zectran pilot test project

	F.Y. 1969 <u>904 (044)</u>	F.Y. 1970 <u>004 (044)</u>
Aircraft		
C-47 (1 from R-1 (Contract Johnson's)		
(1 from R-4	--	2,000 (1,000 each)
Lead plane (Cessna 180-182) (25 hours)	--	855
Smoke plane (Cessna 180)	200	500
Smoke generator	379	--
Dowanol TPM	9,645	--
Freon gas	25,000	--
Nitrogen	1,250	--
INT Forestry Sciences Lab. (salaries, per diem, and supplies)	3,442	5,272
Additional spray system (to be coordinated by MEDC)	12,000	--
Zectran	18,048	--
Personnel		
Salaries and per diem		
Fire Control (1, R-4; 2, R-1)	700	1,200
Checkers (local Nezperce) (20 men and 14 women)	4,116	6,500
Admin. man (GS-7 or GS-9)	720	720
Biol. Techn. (GS-5)	500	700
Forestry Aid (GS-4)	400	600
Time and travel for:		
Honing and Dewey (S&PF personnel)	700	550
Detail of at least one		
GS-13 @ 14 days (entomologist)	800*	745*
GS-11 @ 30 days (2 entomologists)	1,400*	1,600*
I&E (Div. of I&E, grade and time unknown, but approximately 10 man-days' time)		595*

* Includes salary, per diem, and transportation.

Table 1.--Estimated cost, 1969 spruce budworm Zectran pilot test project (con.)

	F.Y. 1969 <u>904 (044)</u>	F.Y. 1970 <u>004 (044)</u>	
Miscellaneous			
Mileage	400	900	
Shipment of Zectran (Region 4 to Region 1)	500		
Carvusoil	50		
Cold storage	150		
Install and remove smoke generator	100		
Miscellaneous equipment and supplies	<u>1,500</u>	<u> </u>	
	82,000	+	22,737 = 104,737

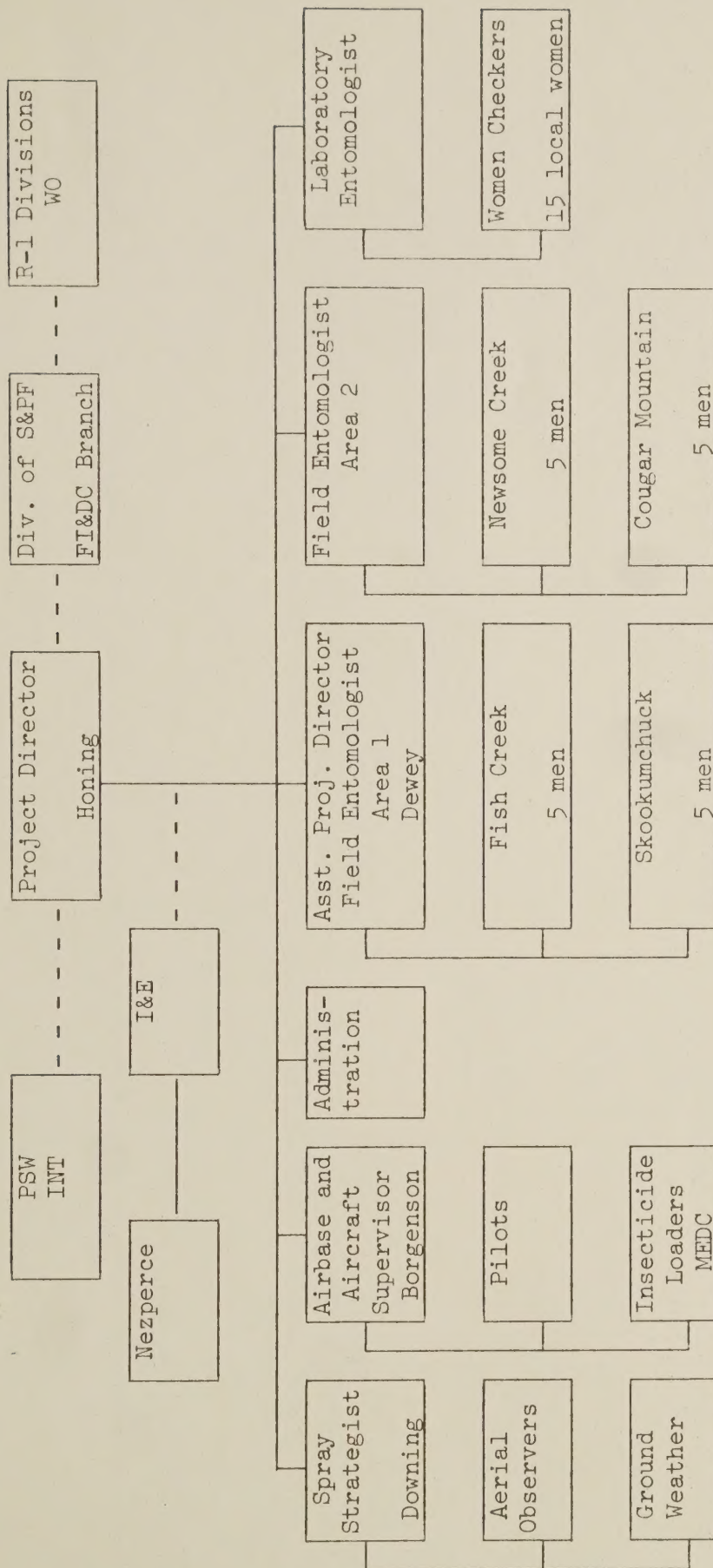
Table 2.--Zectran project personnel and duties, F.Y. 1969 - F.Y. 1970

<u>Project title</u>	<u>No. men</u>	<u>Type of men</u>	<u>Brief description of duties</u>	<u>To be provided by</u>	<u>Approximate period needed</u>
Project director	1	GS-12 Entomologist	Overall supervision, planning, management.	RO - S&PF	January to final report
Entomologist	3	GS-11 Entomologist	Trains entomology crews, determines insect readiness for spraying, releases spray blocks, and determines insect mortality.	RO - S&PF Detail	January to final report
Foliage checkers	15	GS 2-3	Check foliage for insects in lab. Rear budworm, parasites and associated insects.		June 16 to July 21
Field collectors	20	GS 3-5 Laborers	Take samples to evaluate insect readiness for spraying and mortality.	Lolo NF	June 16 to July 14
Technical advisors		Entomologist	Provide technical direction and services to project leader in new techniques of spraying with experimental insecticide Zectran.	Dir., PSW SA	June 23 to July 11
Air operations officer	1	Pilot	Directs activities of pilots, loaders, and equipment development personnel during project period. Acts as safety and liaison officer during developmental phases of spray equipment design. Acts as air safety officer.	RO - FC	June 23 to July 11
Pilots	2	Pilots	Fly spray and observer and administrative aircraft as needed.	R-1 & R-4	June 23 to July 11

Table 2.--Zectran project personnel and duties, F.Y. 1969 - F.Y. 1970 (con.)

<u>Project title</u>	<u>No. men</u>	<u>Type of men</u>	<u>Brief description of duties</u>	<u>To be pro- vided by</u>	<u>Approximate period needed</u>
Equipment Development	2	GS-11 Engineers	Design, install, and maintain spray equipment capable of pro- ducing spray drops from 1 to 50 microns in size.	R-1 - EDC	As needed
Aquatic and terres- trial surv. leaders	2	GS 11-12 Biologists	Plan and lead respective phases of surveillance.	RO - S&PF and R&W	As needed
Administrative Asst.	1	GS 5-7 Clerk	Orders and issues supplies, acts as timekeeper, prepares accident reports, etc.	Nezperce	May 29 to July 21

APPENDIX



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